

WHAT IS CLAIMED IS:

1. A process for the ethoxylation of liquid organic substances with an ethoxylating liquid, said process comprising:

5 passing a reactive organic fluid through reaction channels defined by a first side of a plurality of vertically positioned corrugated plates that contain perforations;

 circulating a reactant stream containing ethylene oxide through distribution channels defined by the second side of said vertical positioned plates to indirectly exchange heat with said organic fluid;

10 distributing a portion of the reactant stream through the perforations, and contacting the reactant stream with the organic fluid in said reaction channels; and recovering a reaction product from said reaction channels.

2. The process of claim 1 wherein one of said ethoxylation reactants comprises an alcohol or an alkylphenol.

15 3. A reactor for the controlled distribution of reactants comprising:

 a plurality of contacting plates containing perforations or permeable sections stacked adjacent to one another to define reaction channels between the first sides of adjacent plates;

 means for passing a first fluid into the reaction channels;

20 a distribution channel located between each reaction channel defined by the second side of the plates for distributing a second fluid through the plates and circulating the second fluid as an indirect heat exchange medium;

 means for supplying said second fluid to the distribution channels; and

25 means for collecting a fluid stream containing a reaction product from the reaction channels.

4. The reactor of claim 3 wherein said plates define corrugations that extend at least partially in a horizontal direction

